

DO NOT OPEN THIS TEST BOOKLET TILL YOU ARE ASKED TO DO SO

TR/DLTI/AUTO/P-II/17

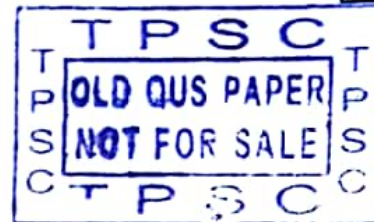
Test Booklet Series

TEST BOOKLET
GENERAL ABILITY TEST
(PART-II)
(Automobile Engineering)

B

(Signature of the Candidate)

(Invigilator's Signature)



Time Allowed – 1 hour 30 minutes (One hour thirty minutes)

Maximum Marks – 60

I N S T R U C T I O N S

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE SCREENING TEST, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. ENCODE CLEARLY THE TEST BOOKLET SERIES IN THE APPROPRIATE PLACE IN THE ANSWER SHEET BY BLACK BALL POINT PEN ONLY.
3. This Test Booklet contains 60 items (questions). Each question, carrying 1 (one) mark only, has four responses (answers). You will select the response which you want to mark on the Answer Sheet. In case you feel that there is more than one correct response, mark the response which you consider the most appropriate. In any case, choose ONLY ONE response for each item.
4. You have to mark all your responses by **Black Ball Point Pen only** on the separate Answer Sheet provided. See directions in the Answer Sheet.
5. All items carry equal marks.
6. Before you proceed to mark in the Answer Sheet the responses to various items in the Test Booklet, you have to fill in some particulars in the Answer Sheet.
7. After you have completed filling in responses on the Answer Sheet and the Screening Test is completed, you should handover the Answer Sheet to the Invigilator only. You are permitted to take the Test Booklet with you.
8. Sheets for rough work are appended on the Test Booklet at the end.
9. **Penalty for wrong answers :**
 - (a) There will be four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **one-third** of the marks assigned to that question will be deducted as penalty.
 - (b) If a candidate gives more than one answer, it will be treated as a **Wrong Answer** even if one of the given answers happens to be correct and there will be same penalty as above to that question.
 - (c) If a question is left blank, i.e no answer is given by the candidate, there will be **no** penalty for that question.

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Four options are given against each of the following questions. Select the best/correct option from among the four options and encode in the answer sheet by using **Black Ball Point Pen** only as per example given below :

Example : The capital of India is

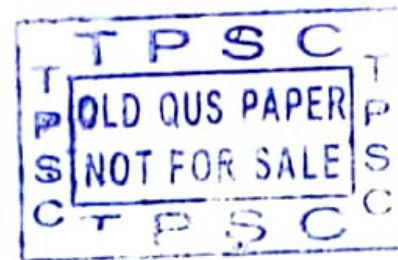
(A) Delhi

☒ New Delhi

(C) Indraprastha

(D) None of these

1. The combustion in compression ignition engine is
 - (A) homogeneous
 - (B) heterogeneous
 - (C) laminar
 - (D) turbulent
2. Antiknock for compression ignition engines is
 - (A) Naphthene
 - (B) Tetraethyl lead
 - (C) Amylnitrate
 - (D) Hexadecane
3. In a four stroke cycle diesel engine, the compression
 - (A) Starts at 40° after bottom dead centre and ends at 10° before top dead centre.
 - (B) Starts at 40° before top dead centre and ends at 40° after top dead centre.
 - (C) Starts at top dead centre and ends at 40° before bottom dead centre.
 - (D) None of these
4. In the crankcase method of scavenging, the air pressure is produced by
 - (A) Supercharger
 - (B) Centrifugal pump
 - (C) Natural aspirator
 - (D) Movement of engine piston
5. The process of breaking up on a liquid into fine droplets by spraying is called
 - (A) Vaporisation
 - (B) Carburetion
 - (C) Ionization
 - (D) Automization
6. In a naturally aspirated diesel engine, the air is supplied by
 - (A) A supercharger
 - (B) A centrifugal blower
 - (C) A vacuum chamber
 - (D) An injection tube



7. The ratio of the work obtained at the crankshaft in a given time to the energy supplied during the same time is called

- (A) Mechanical efficiency
- (B) Overall efficiency
- (C) Indicated thermal efficiency
- (D) Volumetric efficiency

8. A petrol engine, during suction stroke draws

- (A) Air only
- (B) Petrol only
- (C) A mixture of petrol and air
- (D) None of these

9. The fuel air ratio in a petrol engine fitted with suction carburettor, operating with dirty air filter as compared to clean filter will be

- (A) Higher
- (B) Lower
- (C) Remain unaffected
- (D) None of these

10. Pick up the wrong statement

- (A) 2-stroke engine can run in any direction
- (B) In 4-stroke engine, a power stroke is obtained in 4-strokes
- (C) Thermal efficiency of 4-stroke engine is more due to positive scavenging
- (D) Petrol engines occupy more space than diesel engines for same power output.

11. Which of the following fuel has little tendency towards detonation ?

- (A) Benzene
- (B) ISO-octane
- (C) Normal heptane
- (D) Alcohol

12. If the intake air temperature of I.C. engine increases, its efficiency will

- (A) Increase
- (B) Decrease
- (C) Remain same
- (D) None of these

13. The specific fuel consumption of a petrol engine compared to diesel engine of same H.P is

- (A) Same
- (B) More
- (C) Less
- (D) Less or more depending on operating conditions.

14. The two reference fuels used for cetane rating are

- (A) Cetane and ISO-octane
- (B) Cetane and alpha-methyl naphthalene
- (C) Cetane and normal heptane
- (D) Cetane and tetra ethyl lead

15. If petrol is used in a diesel engine, then
- (A) Low power will be produced
 - (B) Efficiency will be low
 - (C) Higher knocking will occur
 - (D) Black smoke will be produced
16. The fuel in diesel engine is normally injected at a pressure of
- (A) 5-10 kg/cm²
 - (B) 20-25 kg/cm²
 - (C) 60-80 kg/cm²
 - (D) 90-130 kg/cm²
17. A diesel engine, during suction stroke, draws
- (A) Air only
 - (B) Diesel only
 - (C) A mixture of diesel and air
 - (D) None of these
18. Scavenging is usually done to increase
- (A) Thermal efficiency
 - (B) Speed
 - (C) Power output
 - (D) Fuel consumption
19. Most high speed compression engines operate on
- (A) Otto cycle
 - (B) Diesel cycle
 - (C) Dual cycle
 - (D) Carnot cycle
20. The pressure at the end of compression in petrol engines, is approximately
- (A) 10 bar
 - (B) 20 bar
 - (C) 25 bar
 - (D) 35 bar
21. For the same compression ratio and for same heat added
- (A) Otto cycle is more efficient than diesel cycle
 - (B) Diesel cycle is more efficient than otto cycle
 - (C) Efficiency depends on other factors
 - (D) None of these
22. Supercharging is essential in
- (A) Diesel engines
 - (B) Gas turbines
 - (C) Petrol engines
 - (D) Aircraft engines



23. Monse test is used to determine the I.P of a
- (A) Single cylinder petrol engine
 - (B) Four stroke engine
 - (C) Single cylinder diesel engine
 - (D) Multi cylinder engine
24. The air volume in the cylinder with the piston of B.D.C divided by the clearance volume is called
- (A) Compression ratio
 - (B) Piston displacement
 - (C) Cylinder ratio
 - (D) Volumetric ratio
25. The percentage of the energy in the petrol burnt in the engine which is actually utilized in propelling the car is a little as
- (A) 25%
 - (B) 60%
 - (C) 35%
 - (D) 15%
26. In an operating engine, the hottest part of the piston is the
- (A) Head
 - (B) Ring grooves
 - (C) Skirt
 - (D) Pin bosses
27. Almost all bearing used in automotive engines are
- (A) Guide bearing
 - (B) Friction bearing
 - (C) Antifriction bearing
 - (D) None of these
28. With an increase in temperature, the resistance of carbon is
- (A) Unchanged
 - (B) Decreased
 - (C) Increased
 - (D) None of these
29. The most commonly used material for tyre-tubes is
- (A) Butyl
 - (B) Natural rubber
 - (C) Butane
 - (D) None of these
30. Gudgeon pins or piston pins are made by
- (A) Piston material itself
 - (B) Cork
 - (C) Cast iron
 - (D) Hardened and ground steel

31. The working fluid normally used in hydraulic brake systems is
- High speed diesel oil along with alcohol
 - SAE 20 oil with anti-corrosion additives
 - A mixture of vegetable oil and SAE 10 oil
 - A solution of castor oil in alcohol with neutralizer.
32. To develop high voltage for the spark plug of spark ignition engine
- Distributor is installed
 - Ignition coil is installed
 - Carburettor is installed
 - Battery is installed
33. Standard firing order for 6 cylinder petrol engine is
- 1 - 4 - 2 - 6 - 3 - 5
 - 1 - 2 - 3 - 4 - 5 - 6
 - 1 - 3 - 5 - 2 - 4 - 6
 - 2 - 4 - 6 - 1 - 3 - 5
34. For petrol engines the method of governing employed is
- Quality governing
 - Quantity governing
 - Hit and miss governing
 - None of these
35. The torque developed by engine is maximum
- at maximum speed of the engine
 - at maximum volumetric efficiency speed of the engine
 - at minimum speed of the engine
 - at maximum power speed of the engine
36. The thermal efficiency of a good internal combustion engine at rated load is in the range of
- 10 to 20%
 - 30 to 35%
 - 60 to 70%
 - 80 to 90%
37. Voltage developed to strike spark in the spark plug is in the range
- 1000 to 2000 volts
 - 20000 to 25000 volts
 - 6 to 12 volts
 - Any of the above
38. Air standard efficiency of diesel cycle is expressed as
- $1 - \frac{1}{r^{\gamma}} \left[\frac{r_c^{\gamma} - 1}{r(r_c - 1)} \right]$
 - $1 - \frac{1}{r^{\gamma-1}} \left[\frac{r_c^{\gamma} + 1}{r(r_c - 1)} \right]$
 - $1 - \frac{1}{r^{\gamma-1}} \left[\frac{r_c^{\gamma} - 1}{r(r_c - 1)} \right]$
 - $1 - \frac{1}{r^{\gamma-1}} \left[\frac{(r_c^{\gamma} - 1)r}{r_c - 1} \right]$



39. Ignition quality of diesel engine fuel is expressed by an index called
- (A) Octane number
 - (B) Cetane number
 - (C) Calorific value
 - (D) Auto-ignition temperature
40. The air / fuel ratio for idling speed of an automotive petrol engine is approximately
- (A) 10 : 1
 - (B) 15 : 1
 - (C) 17 : 1
 - (D) 21 : 1
41. The size of fly wheel for two-stroke cycle I.C engine as compared to four-stroke cycle engine for the same power and same speed is
- (A) Larger
 - (B) Smaller
 - (C) Same
 - (D) None of these
42. For a four stroke cycle I.C engine, running at 2000 rpm has its cam shaft running at
- (A) 4000 rpm
 - (B) 2000 rpm
 - (C) 1000 rpm
 - (D) Cam shaft speed independent of speed of engine
43. For otto cycle the increase in compression ratio leads to
- (A) Increase in thermal efficiency but decrease in mean effective pressure
 - (B) Decrease in thermal efficiency but increase in mean effective pressure
 - (C) Increase in thermal efficiency and increase in mean effective pressure
 - (D) No change in thermal efficiency and mean effective pressure.
44. In spark ignition engines, advancing the spark timing —
- (A) reduces the possibility of knock
 - (B) increase the possibility of knock
 - (C) does not effect at all the possibility of knock
 - (D) may increase or decrease the possibility of knocking depending on weak spark or strong spark
45. Four stroke cycle spark ignition engine as compared to two-stroke cycle engine for the same compression ratio and same rated BHP output has
- (A) better thermal efficiency
 - (B) better specific output in BHP/kg weight
 - (C) higher specific fuel combustion
 - (D) lower thermal efficiency

46. The petrol from tank in an automotive which is fed to the engine by

 - Gravity
 - Suction pressure created during suction stroke
 - A separate pump run by the engine
 - Capillary action

47. Work done on the gas (air) in a steady flow compression process is the lowest when

 - The compression index $n = 1$
 - The compression index $n = \gamma = 1.4$
 - The compression index $n = 1.2$
 - The compression index $n = 1.5$

48. The size of an engine cylinder is referred to in term of its

 - Diameter and bore
 - Bore and length
 - Bore and stroke
 - None of these

49. Changing position of an object against an opposing force is called

 - Power
 - Torque
 - Energy
 - Work

50. The most widely used brakes are operated

 - Electrically
 - Hydraulically
 - By air pressure
 - By vacuum

51. For a fixed compression ratio, the thermal efficiency of diesel cycle

 - increase with increase in cut-off ratio
 - decrease with increase in cut-off ratio
 - is independent of cut-off ratio
 - is not predictable with cut-off ratio

52. The following volume of air is required for consuming 1 liter of fuel by a four stroke engine

 - 1 m^3
 - 5 m^3
 - 56 m^3
 - 91 m^3

53. The thermal efficiency of diesel engines on weak mixture is

 - Unaffected
 - Lower
 - Dependent on other factor
 - Higher

54. A heat engine is supplied with 800 kJ/sec of heat at 600°K and heat rejection takes place at 300°K. Which of the following results report a reversible cycle?

- (A) 200 kJ/sec are rejected
- (B) 400 kJ/sec are rejected
- (C) 100 kJ/sec are rejected
- (D) 500 kJ/sec are rejected

55. Mechanical efficiency of a gas turbine as compared to internal combustion reciprocating engine is

- (A) Lower
- (B) Higher
- (C) Same
- (D) Un-predictable

56. A perfect gas at 27°C is heated till its volume is doubled. The pressure is unchanged. The final temperature is

- (A) 54°C
- (B) 540°C
- (C) 327°C
- (D) 600°C

57. The petrol (gasoline) as compared to high speed diesel oil has

- (A) Lower self-ignition temperature
- (B) Higher self-ignition temperature
- (C) Same self-ignition temperature
- (D) None of these

58. The proper indication of incomplete combustion is

- (A) the smoking exhaust from chimney
- (B) high O₂ content in the flue gas sample at exit
- (C) high temperature of flue gas at exit
- (D) high CO content in the flue gas sample at exit.

59. Percentage O₂ by volume in atmospheric air is

- (A) 21%
- (B) 23%
- (C) 29%
- (D) 79%

60. A diesel engine has compression ratio from

- (A) 6 to 10
- (B) 10 to 15
- (C) 16 to 20
- (D) 25 to 40

(Space for rough work)

